Printed Pages: 02 **Sub Code: EEC601**

Paper Id: | 1 | 3 | 1 | 6 | 0 | 1 | **Roll No.** | | | | | | | | | | |

B TECH
(SEM VI) THEORY EXAMINATION 2017-18
Digital Communication

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a) What is the difference between Analog and digital Communication?
b) What do you mean by eye diagram?
c) What is the Significance random signal in probability?
d) What do you mean by Probability density function?
e) What is meant by detection and estimation?
f) Write the expression for minimum error probability of matched filter?
g) What do you mean by spread spectrum?
h) What are the advantages of OFDM?
i) Define information rate?
j) Write the advantage and disadvantage of cyclic codes?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a) Represent the data 10110100 using the following digital data formats with the help of neat sketch (i) Unipolar RZ (ii) Unipolar NZR (iii) Split phase Manchester (iv) AMI RZ
b) Explain the stationary random process with the help of example?
c) Derive an expression for error probability for Optimum filter?
d) Explain multiuser Detection in detail?
e) What is source coding? Explain the source-coding theorem?

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a) Explain M-ary FSK system with help of transmitter and receiver?
b) Draw the block diagram of QPSK system and explain its working?

4. Attempt any *one* part of the following: **10 x 1 = 10**

a) Define random process and explain ensemble and sample function?
b) State and prove the Central Limit Theorem?

5. Attempt any *one* part of the following: **10 x 1 = 10**

a) Explain the coherent receiver for digital carrier modulation?
b) Explain Signal Space analysis of optimum detection?

6. Attempt any *one* part of the following: 10 x 1 = 10

a) Describe the OFDM in detail?

b) With the help of block diagram, Explain Frequency Hopping Modulation?

7. Attempt any *one* part of the following: 10 x 1 = 10

a) Explain the importance of the state and Trellis diagram by considering any example of convolution coder? Discuss Viterbi algorithm?

b) For a (7,4) cyclic code, the generating polynomial $g(x)=1+x+x^3$. Find the code word if the data worded (i) 0011 (ii) 0100
What do you mean by Hard and Soft decision decoding?